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EXAMINER

RUDE, TIMOTHY L

ART UNIT PAPER NUMBER

2871

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

### Application No.

09/901,079

### Applicant(s)

LEE ET AL.

### Examiner

Timothy L Rude

### Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings and Claims***

1. Figures 1-7D should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. These figures illustrate a conventional device per Specification Page 3, line 19, Page 4, lines 21 and 22, and Page 11, lines 12-18. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. Please note that Drawings filed 03 September 2003 cite the wrong Application number, but the proposed correction of the labeling would be approved by Examiner.

Claims 9, 12, 16, and 30 are amended necessitating new grounds of rejection.

### ***Claim Rejections - 35 USC § 112***

2. Rejections under 35 U.S.C. 112, first paragraph, are withdrawn.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 7-16, and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (APA) in view of Michiaki et al (Michiaki) Japanese Patent Abstract Publication 2000-111957.

As to claim 1, APA discloses an in-plane switching liquid crystal display device comprising:

- first and second substrates, 30 and 32 respectively;
- a gate line, 50, arranged in one direction on the first substrate;
- a common line, 54, arranged on the first substrate;
- a gate insulation layer, 70, on the first substrate;
- a data line, 62, on the gate insulation layer;
- a first passivation layer, 74, on the gate insulation layer, and a plurality of common electrodes, 54a, an insulating layer over the common electrodes, and a plurality of pixel electrodes, 66a, on said insulating layer, and
- a liquid crystal layer between the first and second substrates..

APA does not explicitly disclose a common electrode on the first passivation layer; a second passivation layer on the first passivation layer;

a pixel electrode on the second passivation layer.

Michiaki teaches in Drawing 1, the use of a common electrode, 103, on a protective coat, 108 (Applicant's the first passivation layer); an overcoat layer, 112 (Applicant's second passivation layer) on the first passivation layer; and

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a pixel electrode, 114, on the second passivation layer to allow for easy manufacture of a color display that prevents color unevenness for better display performance (Abstract and [0013]).

Michiaki is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a common electrode on the first passivation layer; a second passivation layer on the first passivation layer; and a pixel electrode on the second passivation layer to allow for easy manufacture of a color display that prevents color unevenness for better display performance.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA with the common electrode on the first passivation layer; a second passivation layer on the first passivation layer; and a pixel electrode on the second passivation layer to allow for easy manufacture of a color display that prevents color unevenness for better display performance.

As to claim 7, APA discloses a device wherein the common line, 54, is parallel with the gate line, 50, and spaced apart from the gate line.

As to claim 8, APA discloses a device wherein the data line, 60, is perpendicular to the gate line, 50.

As to claim 9, APA discloses a device further comprising a thin film transistor at a crossover point of the gate line, 50, and the data line, 60.

As to claim 10, APA discloses a device wherein the thin film transistor includes a gate electrode, 52, an active layer, 72, and source, 62, and drain, 64, electrodes.

As to claims 11 and 12, APA in view Michiaki disclose the device of claim 1.

APA in view Michiaki do not explicitly disclose a device wherein the first passivation layer includes a plurality of common line contact holes and wherein each common electrode is electrically connected with the common line through the corresponding common line contact hole.

Michiaki discloses a device wherein the first passivation layer includes a contact hole for connecting the pixel electrode.

Note that in considering a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

Michiaki is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add contact holes in the passivation layer as needed to connect a plurality of common electrodes to the common line.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the passivation layer of APA

in view of Michiaki with the contact holes of Michiaki to connect a plurality of common electrodes to the common line.

As to claims 13 and 14, Michiaki discloses a device wherein the second passivation layer includes a drain contact hole to electrically connect the pixel electrode to the drain.

As to claim 15, APA discloses a device wherein each pixel electrode is arranged between the adjacent common electrodes.

As to claim 16, the steps of manufacturing comprising forming would have been obvious given the structure above.

As to claim 24, APA discloses the use of Al, Cr, Mo, and W for the first and second metal layers (Specification, Page 6, lines 10-11). The steps of manufacturing comprising forming, depositing, and patterning would have been obvious given the structure above.

As to claims 25-29, the steps of manufacturing comprising forming, depositing, patterning, and making electrically connected, would have been obvious given the structure above.

4. Claims 2-3 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view Michiaki, as applied to claim 1 above, and further in view of Shin et al (Shin) USPAT 6,356,328 B1.

As to claims 2 and 3, APA in view Michiaki disclose the device of claim 1.

APA in view Michiaki do not explicitly disclose a device wherein the common and pixel electrodes are formed of the transparent conductive material.

Shin teaches the use of common and pixel electrodes formed of the transparent conductive material ITO to increase the aperture ratio and transmittance of the LCD (Abstract and col. 3, lines 37-47).

Shin is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add common and pixel electrodes formed of the transparent conductive material ITO to increase the aperture ratio and transmittance of the LCD.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA and Michiaki with the common and pixel electrodes formed of the transparent conductive material ITO of Shin to increase the aperture ratio and transmittance of the LCD.



As to claims 17-20, the steps of manufacturing comprising depositing and patterning would have been obvious given the structure above.

5. Claims 4 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view Michiaki, as applied to claim 1 above, and further in view of Chang et al (Chang) USPAT 6,163,355.

As to claim 4, APA in view Michiaki disclose the device of claim 1.

APA in view Michiaki do not explicitly disclose a device wherein the gate insulation layer and the second passivation layer are one of Silicon Nitride ( $\text{SiN}_x$ ) and Silicon Oxide ( $\text{SiO}_2$ ).

Chang teaches that  $\text{SiN}_x$  is used as a passivation layer in a conventional LCD.

Chang is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use  $\text{SiN}_x$  as an art-recognized material suitable for the intended purpose of forming a passivation layer.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view Michiaki with  $\text{SiN}_x$  of Chang as an art-recognized material suitable for the intended purpose of forming a passivation layer (MPEP 2144.07).

As to claim 23, the steps of manufacturing comprising forming, depositing, and patterning would have been obvious given the structure above.

6. Claims 5-6 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view Michiaki, as applied to claim 1 above, and further in view of Akiyama et al (Akiyama) USPAT 6,414,729 B1.

As to claims 5 and 6, APA in view Michiaki disclose the device of claim 1.

APA in view of Michiaki do not explicitly disclose a device wherein the first passivation layer is formed of an organic material, wherein said organic material is one of benzocyclobutene (BCB) and acryl.

Akiyama teaches the use of an organic resin film such as BCB for the insulation layers (col. 9, lines 59-67) to shield the liquid crystal layers from the scanning and signal lines (col. 2, lines 22-24).

Akiyama is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use of BCB for the insulation layers to shield the liquid crystal layers from the scanning and signal lines.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Michiaki with the BCB insulation layers of Akiyama to shield the liquid crystal layers from the scanning and signal lines.

As to claims 21 and 22, the steps of manufacturing comprising forming, depositing, and patterning would have been obvious given the structure above.

7. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Michiaki, as applied to claims 1-29 above, and further in view of Wakagi et al (Wakagi) USPAT 6,300,995 B1.

As to claim 30, APA in view of Michiaki disclose the device above, wherein the first passivation layer is Applicant's second insulation layer and the second passivation layer is Applicant's third insulation layer.

APA in view of Michiaki does not explicitly disclose a device wherein a plurality of first contact holes through the first and second insulation layers over the common line; and a plurality of common electrodes on the second insulation layer, wherein the common electrodes contact the common line via the first contact holes.

Wakagi teaches in Figures 6 and 7 a device wherein a plurality of first contact holes through the first and second insulation layers over the common line; and a plurality of common electrodes on the second insulation layer, wherein the common electrodes contact the common line via the first contact holes to reduce losses in the driving voltage applied to the liquid crystal, by providing an active matrix substrate in which degradation of the metal electrode is prevented in a liquid crystal display device (col. 2, lines 6-10).

Wakagi is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a plurality of first contact holes through the first and second insulation layers over the common line; and a plurality of common electrodes on the second insulation layer, wherein the common electrodes contact the common line via the first contact holes to reduce losses in the driving voltage applied to the liquid crystal, by providing an active matrix substrate in which degradation of the metal electrode is prevented in a liquid crystal display device.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Michiaki with a plurality of first contact holes through the first and second insulation layers over the common line; and a plurality of common electrodes on the second insulation layer, wherein the common electrodes contact the common line via the first contact holes of Wakagi to reduce losses in the driving voltage applied to the liquid crystal, by providing an active matrix substrate in which degradation of the metal electrode is prevented in a liquid crystal display device.

As to claim 31, APA discloses, in Figure 6, pixel electrodes electrically communicated with one another via a transverse pixel electrode perpendicular to the common electrodes.

8. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Michiaki and Wakagi, as applied to claims 1-31 above, and further in view of Shin.

As to claim 32 and 33, APA in view Michiaki and Wakagi disclose the device above.

APA in view Michiaki and Wakagi do not explicitly disclose a device wherein the common and pixel electrodes are formed of the transparent conductive material.

Shin teaches the use of common and pixel electrodes formed of the transparent conductive material ITO to increase the aperture ratio and transmittance of the LCD (Abstract and col. 3, lines 37-47).

Shin is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add common and pixel electrodes formed of the transparent conductive material ITO to increase the aperture ratio and transmittance of the LCD.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA and Michiaki and Wakagi with the common and pixel electrodes formed of the transparent conductive material ITO of Shin to increase the aperture ratio and transmittance of the LCD.

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9. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Michiaki and Wakagi, as applied to claims 1-31 above, and further in view of Chang.

As to claim 43, APA in view Michiaki and Wakagi disclose the device above.

APA in view Michiaki and Wakagi do not explicitly disclose a device wherein the gate insulation layer and the second passivation layer are one of Silicon Nitride ( $\text{SiN}_x$ ) and Silicon Oxide ( $\text{SiO}_2$ ).

Chang teaches that  $\text{SiN}_x$  is used as a passivation layer in a conventional LCD.

Chang is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use  $\text{SiN}_x$  as an art-recognized material suitable for the intended purpose of forming a passivation layer.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view Michiaki and Wakagi with  $\text{SiN}_x$  of Chang as an art-recognized material suitable for the intended purpose of forming a passivation layer (MPEP 2144.07).

10. Claim 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Michiaki and Wakagi, as applied to claims 1-31 above, and further in view of Akiyama.

As to claims 35 and 36, APA in view Michiaki and Wakagi disclose the device above.

APA in view of Michiaki and Wakagi do not explicitly disclose a device wherein the first passivation layer is formed of an organic material, wherein said organic material is one of benzocyclobutene (BCB) and acryl.

Akiyama teaches the use of an organic resin film such as BCB for the insulation layers (col. 9, lines 59-67) to shield the liquid crystal layers from the scanning and signal lines (col. 2, lines 22-24).

Akiyama is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use of BCB for the insulation layers to shield the liquid crystal layers from the scanning and signal lines.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Michiaki and Wakagi with the BCB insulation layers of Akiyama to shield the liquid crystal layers from the scanning and signal lines.

***Response to Arguments***

11. Applicant's arguments filed on 03 September 2003 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

- (1) Regarding the drawings, Applicants make no admittance to prior art.
- (2) Prior art and Michiaki fail to teach a plurality of common electrodes on the first passivation layer.
- (3) Michiaki teaches a common electrode arranged in the overcoat layer on the shading section 111.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that MPEP 608.01(c) (2) clearly indicates that the content of the Background of the Invention section is to provide a description of the related art that describes to the extent practical the state of the prior art or other information disclosed. Where applicable, the problems involved in the prior art or other information disclosed which are solved by the Applicant's invention should be indicated. Applicant's own reference in the Background of the Invention to Figures 1-7D as being of a "typical" and/or "conventional" device (Specification Page 3, line 19, Page 4, lines 21 and 22, and Page 11, lines 12-18) are consistent with requirement of MPEP 608.01(c) (2) to disclose such prior art, and the drawing labels should so reflect per



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MPEP 608.02(g). Please see also MPEP 707.05(b) which states that MPEP 609 sets forth the positive guidelines for Applicants, their Attorneys and Agents who desire to submit prior art for consideration by the U.S. Patent and Trademark Office.

(2) It is respectfully pointed out that APA teaches a plurality of common electrodes on the first passivation layer per rejections above.

(3) It is respectfully pointed out that Michiaki may disclose additional structure since Applicant's claims are in comprising format.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



Timothy L Rude  
Examiner  
Art Unit 2871

TLR  
January 13, 2004



ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800